

IN THE DRAWINGS

The attached sheets of drawings include changes to Figs. 15 and 23. These sheets, which include Figs. 15 and 23, replace the original sheets including Figs. 15 and 23.

Attachment: Replacement Sheets

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the present amendments and following discussion, is respectfully requested.

Claims 1-33 and 41-43 are pending. By this amendment, Claims 34-40 are canceled, Claims 1, 12, 21, 26 and 31 are amended. New Claims 41-43 are added. No new matter has been added. Support for new Claims 41-43 can be found in the specification at page 47, lines 5-8.

The Office Action objects to the specification. The specification and drawings are amended to obviate the objection.

The Office Action rejects Claims 1, 3 and 4 under 35 U.S.C. § 103(a) over USP 6,199,505 to Sato et al. in view of USP 5,474,648 to Patrick et al., Claim 6 under 35 U.S.C. § 103(a) over Sato and Patrick and further in view of USP 6,252,354 to Collins et al., Claims 10-13 and 26-29 under 35 U.S.C. § 103(a) over Sato and Patrick and further in view of USP 6,884,635 to Parsons, Claim 14 under 35 U.S.C. § 102(a) over Sato, Patrick and Parsons and further in view of US Publication No. 2001/0009139 to Shan et al., Claim 15 under 35 U.S.C. § 103(a) over Sato, Patrick and Parsons and further in view of USP 4,340,461 to Hendricks et al., Claim 16 under 35 U.S.C. § 103(a) over Sato, Patrick and Parsons and further in view of Collins, Claims 17-20 under 35 U.S.C. § 103(a) over Sato, Patrick and Parson and further in view of USP 6,631,693 to Hilliker and Claim 30 under 35 U.S.C. § 103(a) over Sato, Patrick and Parsons and further in view of USP 6,270,618 to Nakano et al. These rejections are respectfully traversed.

Before considering the rejections under 35 U.S.C. § 103, it is believed that a brief review of the subject matter of the independent claims would be helpful. In this regard, independent Claim 1 includes an apparatus which performs a plasma process on a target substrate by using plasma including an airtight process chamber which accommodates the

target substrate, a gas supply system which supplies a process gas into the process chamber, an exhaust system which exhausts an interior of the process chamber and sets the interior of the process chamber to a vacuum state. First and second electrodes are arranged in the process chamber to oppose each other. An RF field, which turns the process gas into plasma by excitation, is formed between the first and second electrodes. An RF power supply is connected to the first or second electrode through a matching circuit and supplies RF power. The matching circuit serves to automatically perform input impedance matching relative to the RF power. An impedance setting section provided in addition to the matching circuit is connected through an interconnection, to a predetermined member to be electrically coupled with the plasma in the plasma process. The impedance setting section is configured to set a backward direction impedance as an impedance against an RF component input from the plasma to the predetermined member and is capable of changing a value of the backward direction impedance. A controller supplies a control signal concerning a preset value of the backward direction impedance to the impedance setting section.

With respect to independent Claim 12, independent Claim 12 includes, *inter alia*, an impedance setting section that is provided in addition to the matching circuit and is connected through an interconnection, to a predetermined member to be electrically coupled with the plasma in the plasma process, the impedance setting section being configured to set a backward direction impedance as an impedance against one of the plurality of different higher harmonics relative to a fundamental frequency of the RF power input from the plasma to the predetermined member and capable of changing a value of the backward direction impedance.

With respect to independent Claim 26, independent Claim 26 includes, *inter alia*, first and second interconnections which are respectively connected to the first and second electrodes and which extend to an outside of a process chamber, the first and second

interconnections forming part of an AC circuit including electrical coupling between the first and second electrodes, a first RF power supply which is arranged on the first interconnection and which supplies first RF power, a first matching circuit which is arranged on the first interconnection between the first electrode and the first RF power supply and which automatically performs input impedance matching relative to the first RF power, an impedance setting section arranged on the first interconnection in addition to the first matching circuit, the impedance setting section being configured to set a backward direction impedance as an impedance against an RF component input from the plasma to the first electrode and capable of changing a value of the backward direction impedance, and the RF component including a harmonic of a fundamental frequency of the first RF power.

With respect to the rejection of Claims 1-4 under 35 U.S.C. § 103(a) over Sato in view of Patrick, the Office Action recognizes that Sato does not disclose an impedance setting section and controller. According to Claim 1, characteristics of a plasma process performed on a target substrate can be suitably controlled by adjusting a backward direction impedance. The impedance setting section is arranged to set the backward direction impedance in addition to a matching circuit conventionally used for a power supply. The impedance setting section sets a backward direction impedance, which is an impedance against an RF component input from the plasma to the lower electrode 18 due to the 60 MHz power supply from the first RF power supply 14 to the upper electrode 6.

Applicants respectfully disagree with the Office Action's assertion that Patrick cures the deficiencies of Sato. In Patrick, the power controller 204 controls an RF power generated from an RF generator 102 in accordance with an RF power measured by the RF sensor 202. This is not related to backward direction impedance. In Patrick, power sensor 202 measures the radio frequency power being delivered to the plasma chamber 104. A power controller 204 utilizes a signal representative of the measured power from the power sensor 202 to

control the amount of power from the RF chamber 102. Matching network 120 automatically adjusts to produce a match condition between the RF generator 102 and the plasma chamber 104. This is not related to impedance against an RF component input from the plasma to the lower electrode.

With respect to the rejection of Claims 10-13 and 26-29 under 35 U.S.C. § 103(a) over Sato, Patrick and further in view of Parsons, in particular with respect to independent Claims 12 and 26, the Office Action recognizes that neither Sato nor Patrick disclose harmonic content in the RF component. Applicants respectfully disagree with the Office Action's assertion that Parsons cures the deficiencies of Sato and Patrick. Furthermore, as discussed above, Applicants respectfully disagree with the Office Action's assertion that Patrick discloses setting of background direction impedance.

Parsons discloses reflecting power at higher harmonics back into the plasma rather than dissipating it. However, this description literally discloses returning higher harmonics back into plasma and is not related to changing a value of the backward direction impedance, as in independent Claims 12 and 26.

The remaining references do not provide the deficiencies of Sato, Patrick and Parsons discussed above.

The dependent claims are allowable for at least the reasons discussed above as well as for the individual features they recite.

For the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. A Notice of Allowance is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance. The Examiner is encouraged to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

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